

ABSTRACT OF THE DISCLOSURE

This ion source is set up to satisfy a relation

$$L < 3.37B^{-1}\sqrt{V_A} \times 10^{-6}$$

where the arc voltage applied between a plasma production
5 vessel 2 and a filament 8 is $V_A[V]$, the magnetic flux density
of a magnetic field 19 within the plasma production vessel 2
is $B[T]$, and the shortest distance from a most frequent electron
emission point 9 located almost at the tip center of the
filament 8 to a wall face of the plasma production vessel 2

10 is $L[m]$.